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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/621,588	07/17/2003	Jun-Ho Koh	5000-1-350	2607

33942 7590 08/02/2006

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EXAMINER	
LE, THI Q	

ART UNIT	PAPER NUMBER
2631	

DATE MAILED: 08/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/621,588	KOH ET AL.	
	Examiner	Art Unit	
	Thi Q. Le	2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 July 2003 and 02 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 July 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/02/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

Information Disclosure Statement

2. The information disclosure statement (IDS) filed on 12/02/2005 was considered by the examiner.

Drawings

3. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office Action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended". If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the Examiner, the Applicant will be notified and informed of any required corrective action in the next Office Action. If a response to the present Office Action fails to include proper drawing corrections, corrected drawings or arguments therefor, the response can be held **NON-RESPONSIVE** and/or the application could

be **ABANDONED** since the objections/corrections to the drawings are no longer held in abeyance.

4. **Figures 1 and 2** should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. **Claim 7** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

On line 3 of claim 7; a wavelength-division multiplexer cannot perform the function of demultiplexing. Also on line 5 of claim 7; a time-division multiplexer cannot perform the function of time-division demultiplexing.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. **Claim 1** is rejected under 35 U.S.C. 102(e) as being anticipated by **Combs et al. (US Patent # 6,751,417)**.

Consider **claim 1**, Combs et al. clearly show and disclose; a broadcast/communication unified passive optical network system, comprising: an optical line termination (Mux-Node 104) for time-division multiplexing received digital broadcast signals (broadcast signals), for receiving communication signals (cable modem signals) from an electronic network, and for wavelength-division multiplexing and transmitting the digital broadcast signals and the communication signals (abstract: figure 1 and 2; column 3 lines 45-65; column 5 lines 51-65);

A plurality of optical network units connected to the optical line termination in one-to-multi connection, each of said optical network units (mini-Fiber Node 108) receiving the broadcast signals and the communication signals (cable modem signals) from the optical line termination, the plurality of optical network units for time-division demultiplexing the multiplexed digital broadcast signals (lightwave interface device, 202, separates the first and second down stream signal), and outputting a subset of the demultiplexed digital broadcast signals selected in accordance with a subscriber control signal and the communicating signals (abstract; figure 5; column 8 lines 32-63) ; and

A plurality of setup boxes connected to the plurality of optical network units in one-to-multi connection, each of the plurality of setup boxes (End-user 112) receiving the broadcast signals and communication signals from a corresponding optical network unit, the plurality of setup boxes further configured to send subscriber control signals (upstream signal) input by a

subscriber to the corresponding optical network unit (abstract; figure 1; column 2 lines 30-35; and column 4 lines 10-43).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. **Claims 2 and 3** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Combs et al. (US Patent # 6,751,417)** in view of **Goodman et al. (US Patent # 5,666,487).**

Consider **claim 2, and as applied to claim 1 above,** Combs et al. disclose the invention as described above, except for wherein the received digital broadcast signals is an MPEG2 multi-program transport stream.

In related art, Goodman et al. disclose a network providing signals of different formats to a user. Video signals are compress according to MPEG format; to be more specific MPEG2, which are second generation compression standards (abstract; column 2 lines 8-25).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate the teaching of Goodman et al. into Combs et al. Since compressing video signal free up bandwidth; extra bandwidth can be use to transfer other data or more video signals. By using MPEG2 standards allow for better video compression.

Consider **claim 3 and applied to claim 1 above**, Combs et al. disclose the invention as described above, except for wherein the electronic network is the Internet.

In related art, Goodman et al. disclose a network providing signals of different formats to a user. The network can also transfer packet type signal, which were obtained from the internet and transfer to the end-user (abstract; figure 2; column 12 lines 8-18).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate the teaching of Goodman et al. into Combs et al. Since the cable modem disclose by Comb et al. need an internet to retrieve information; Goodman et al. disclose of such internet connectivity for which the cable modem can be connect to.

13. **Claims 4 and 5** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Combs et al. (US Patent # 6,751,417)** in view of **Ahmed et al (US Patent # 6,519,773)**.

Consider claim 4 and as applied to claim 1 above, Combs et al. disclose a method of transferring data using wavelength division multiplex with in the invention as described above, except for; wherein the optical line termination comprises: a first and a second format converter for format-converting the digital broadcast signals from a moving image format into a time-

division multiplexing (TDM) format; a time-division multiplexer which time-division multiplexes the format-converted digital broadcast signals; and a distributor for receiving broadcast signals from the electronic network.

In related art, Ahmed et al. disclose an apparatus for digitized CATV network. The transmitter 113 within the head-end unit 106, contains a plurality of formatter 408 (read as, format converter) followed by a time-division multiplexer 406. Signal from a video feed and the satellite are converted by the formatter 408 and time-division-multiplexed by the multiplexer 406. External data network (read as, electronic network) can also be connected to the transceiver 112 (read as, distributor) and transmitted to the end-user (figure 1 and 4; column 6 lines 46-53; and column 8 lines 20-50).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate the teaching of Ahmed et al. into Combs et al. Since formatting the broadcast signals and Time-division-multiplexing those signals allow addition channels to be easily added as necessary. Video signal transmissions need dedicated bandwidth because it is constant; other data that are bursty can be transport by a different unit that does not have bandwidth dedication. This way efficient use of bandwidth can be achieve.

Consider **claim 5, and as applied to claim 3 above**, Combs et al. as modified by Goodman et al. disclose the invention as described above, except for wherein the TDM format is in accordance with a synchronous digital hierarchy/synchronous optical network (SDH/SONET) standard.

In related art, Ahmed et al. disclose an apparatus for digitized CATV network. Where SONET is use as the digital format, since it is the standard for optical telecommunication transport (column 8 lines 36-50).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate the teaching of Ahmed et al. into Combs et al. as modified by Goodman et al. Since as stated by Ahmed et al. the reason to use a standard SONET is it allows equipment from different suppliers to be used in a fiber system (column 8 lines 36-50).

14. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Combs et al. (US Patent # 6,751,417)** in view of **Ahmed et al (US Patent # 6,519,773),** further in view of **Gomez (US PGPub 2002/0087994)** and further in view of **Lehman et al. (US Patent # 4,763,317)**.

Consider **claim 6 and as applied to claim 4 above,** Combs et al. disclose the invention as describe above; except for wherein the optical line termination further comprises: a first and a second local processor for remultiplexing the broadcast signals to the format converter; a buffer for storing signals received from the VOD server; a distributor; a first E/O converter for converting the format-converted digital broadcast signals provided from the time-division multiplexer; and a second E/O converter for converting the communication signals provided from the distributor.

In related art, Ahmed et al. disclose an apparatus for digitized CATV network. The network contains a plurality ADM, add/drop multiplexer (read as, local processor for remultiplexing). ADM have the function of adding or removing addition channels from the signal. External data network (read as, electronic network) can also be connected to the

transceiver 112 (read as, distributor) and transmitted to the end-user (figure 1 and 11; column 6 lines 46-53; column 15 lines 1-25).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate the teaching of Ahmed et al. into Combs et al. Since video signal transmissions need dedicated bandwidth because it is constant; other data that are bursty can be transport by a different unit that does not have bandwidth dedication. This way efficient use of bandwidth can be achieve. Also by have an add/drop multiplexer, different channels can be add or remove from the signal as necessary.

Combs et al. as modified by Ahmed et al. disclose the invention described above; except for a buffer for storing signals received from the VOD server.

In related art, Gomez discloses a system for video on demand. Within the system is a buffer 20, which stores program from the VOD server.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate the teaching Gomez into Combs et al. as modified by Ahmed et al. Because by providing video on demand, VOD, for the end-user. Then it is necessary to store VOD program so that when the end-user request it; the program is available right away.

Combs et al. as modified by Ahmed et al. and further modified by Gomez disclosed the invention as described above; except for a first E/O converter for converting the format-converted digital broadcast signals provided from the time-division multiplexer; and a second E/O converter for converting the communication signals provided from the distributor.

In related art, Lehman et al. disclose a digital communication network. The network consists of a Local central node 110 (read as, optical line termination) with a feeder interface

600. The feeder interface performs electrical to optical conversion of signals from wideband switch and narrow band switch. Wideband are usually used for video services (read as, broadcast signals) and narrowband can be use for communication (read as, communication signals). (abstract; figures 9 and 10; column 2 lines 40-57; column 20 lines 14-40 and 52-64)

It would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate the teaching Lehman et al. into Combs et al. as modified by Ahmed et al. and further modified by Gomez. Because in WDM communication system, there must consist a plurality of optical-electrical and electrical-optical converters, it is well known within the art of optical communication that equipments for O-E and E-O is necessary.

15. **Claim 7** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Combs et al. (US Patent # 6,751,417)**, in view of **Ahmed et al (US Patent # 6,519,773)**, and further in view of **Lehman et al. (US Patent # 4,763,317).**

Consider **claim 7 and as applied to claim 1 above**, Combs et al. disclose the invention as described above; except for, wherein each of the plurality of optical network unit comprises: a wavelength-division multiplexer for demultiplexing the signals received through the optical fiber; a time-division multiplexer for time-division demultiplexing the demultiplexed broadcast signals; a format converter which converts the broadcast signals having a time-division multiplexing format into a moving image format and outputs the format-converted signals; a controller which transmits only the broadcast signals selected from the format-converted signals in accordance with a subscriber control signal to the setup boxes; and a distributor which outputs the subscriber control signal to the controller and transmits the demultiplexed communication signals to the setup boxes.

In related art, Ahmed et al. disclose an apparatus for digitized CATV network. Received signals are first demultiplexed by demultiplexer, 706, into separate channels. There are a plurality of deformatter 712 (read as, format converter) connected to each channels; the combined function of the demultiplexer, 706, and deformatter 712, is to demultiplex the received time-division multiplexed signals (abstract; figure 7; column 11 lines 47-67).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate the teaching of Ahmed et al. into Combs et al. Since formatting the broadcast signals and Time-division-multiplexing those signals allow addition channels to be easily added as necessary. If formatting has occurred before transmission, then there must be deformatting once the signals are received at the other end. It would easier for system maintenance to have the plurality of deformatters to be place at one location rather; thus putting the deformatter within the optical network unit rather than at each end-user unit, make system maintenance easier.

Combs et al. as modified by Ahmed et al. disclose the invention as described above; except for, a wavelength-division multiplexer for demultiplexing the signals received through the optical fiber; a time-division multiplexer for time-division demultiplexing the demultiplexed broadcast signals; a controller which transmits only the broadcast signals selected from the format-converted signals in accordance with a subscriber control signal to the setup boxes; and a distributor which outputs the subscriber control signal to the controller and transmits the demultiplexed communication signals to the setup boxes.

In related art, Lehman et al. disclose a digital communication network. Wherein each remote node (read as, optical network unit) comprises a digital time-division multiplexer and

demultiplexer; optical signals are transported between central node, remote nodes and end-user through wavelength division multiplexing (WDM). At the remote node, the feeder interface, 502, receives signals, WDM demultiplex and TDM demultiplex the signals; then convert the optical signals into electrical signals. End-user control signals are transmitted to the local central node; then the control signals are forward to the controller, 502, within the remote node. Controller, 502, switch the signals according to the receive control signal. Distributor, 505, receive the switched signal and transmit the signals to end-user; distributor, 505, can also receive upstream signal from the end-user (figure 9; column 18 lines 4-18 and column 19 lines 45-50).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate the teaching Lehman et al. with Combs et al. as modified by Ahmed et al. Since TDM signal can be modified easier; modify as in adding and removing additional channels; WDM transmission makes efficient use of bandwidth. Control and distribution units are necessary to provide services quickly and correctly according to end-user control signals.

16. **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Combs et al. (US Patent # 6,751,417)** in view of **Ahmed et al (US Patent # 6,519,773)**, further in view of **Lehman et al. (US Patent # 4,763,317)**, and further in view of **Vohra et al (US PGPub 2003/0152386 with provisional application date 12/04/2001)**.

Consider **claim 8 and as applied to claim 7 above**, Combs et al. as modified by Ahmed et al. disclose the invention described above; except for, wherein each of the optical network units further comprises: a first O/E converter which converts and outputs the broadcast signals from among the demultiplexed optical signals provided from the wavelength-division multiplexer; a second O/E converter which converts and outputs the communication signals from

among the demultiplexed optical signals provided from the wavelength-division multiplexer; a third O/E converter which converts and outputs the communication signals inputted through the optical fiber; a first frequency converter which outputs the signals provided from the controller after converting the frequency thereof into a first intermediate frequency signal; a second frequency converter which outputs the signals inputted from the distributor after converting the frequency thereof into a second intermediate frequency signal; a signal combiner for combining the signals provided from the first and second frequency converters; and a first E/O converter for converting the signals provided from the signal combiner through the optical fiber.

In related art, Lehman et al. disclose a digital communication network. A remote node (read as, optical network unit) within the network comprises; a feeder interface 501; a controller 502; and a distributor interface 500. The feeder interface, 501, contains a plurality of optical-electrical converters, for converting wideband and narrowband optical signal received from local central node. The distributor interface, 500, contains a plurality of electrical-optical converters and a plurality of optical-electrical converters; E-O converters (read as, first E/O converter) are for converting wideband and narrowband signals received from controller 502, O-E converters (read as, first, second and third O/E converters) are for converting upstream signals (figure 9; column 18 lines 4-51; column 19 lines 45-50; and column 20 lines 14-40).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate the teaching Lehman et al. with Combs et al. as modified by Ahmed et al. Since communications using optical fiber allow for higher bandwidth than conventional coax-cable; optical-electrical and electrical-optical conversion unit is necessary for the optical communication system.

Combs et al. as modified by Ahmed et al. and further modified by Lehman et al. disclose the invention as described above; except for, a first frequency converter which outputs the signals provided from the controller after converting the frequency thereof into a first intermediate frequency signal; a second frequency converter which outputs the signals inputted from the distributor after converting the frequency thereof into a second intermediate frequency signal; and a signal combiner for combining the signals provided from the first and second frequency converters.

In related art, Vohra et al. disclose a multi-format optical signal transport of DWDM cable TV networks. The optical transport apparatus, 100, (read as optical network unit) comprises a plurality of RF up-conversion mechanism, 150, 155 and 160; and an RF combiner mechanism, 165. Each of the RF conversion unit performs frequency conversion of video, voice and internet data separately. The converted signals are then combined together with RF combiner, 165, before optically transmit (figure 1l; page 3 paragraphs 0036 and 0037).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate the teaching Vohra et al. with Combs et al. as modified by Ahmed et al. and further modified by Lehman et al. Up-converting the frequency before transmission allow for more efficient transmission through the optical medium.

17. **Claim 9** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Combs et al. (US Patent # 6,751,417)** in view of **Lehman et al. (US Patent # 4,763,317).**

Consider **claim 9 and as applied to claim 1 above**, Combs et al. disclose the invention as described above; except for wherein each of the setup boxes comprises: a signal separator for separating the signals received over the optical fiber into broadcast signals and communication

signals; and a hub for outputting the communication signals provided from one of a VOD player, a computer and an HDTV to a corresponding subscriber terminal, the hub further configured to receive communication signals including a subscriber control signal for changing broadcast channels from the subscriber terminal.

In related art, Lehman et al. disclose a digital communication network. On the subscriber side; there is a network interface equipment 104, subscriber interface equipment 400 and subscriber communication equipment 460 (combination of the three equipments 104, 400 and 460 form the setup box). Network interface equipment 104, receive the WDM signal and demultiplex the signal into separate channels; then convert the optical channels into electrical channels using a plurality of optical-electrical converters; also it has an electrical-optical converter for converting upstream signals from subscriber back to local central node. The subscriber interface equipment 400 (read as, hub) perform necessary conversion and/or demodulating before outputting the signal to a computer or a television set; it can also receive upstream signals from subscribers (figure 8; column 15 lines 35-54; column 15 lines 60-65; column 16 lines 9-19; and column 16 lines 36-55).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate the teaching Lehman et al. with Combs et al. Since the communication system today uses an all optical transmission rather than coax-cable. Then it is necessary that the subscriber need an optical converter; so that the optical signal can be convert into electrical signal. Optical fiber communication allow for greater bandwidth usage, thus increasing speed in communication.

18. **Claim 10** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Combs et al. (US Patent # 6,751,417)** in view of **Lehman et al. (US Patent # 4,763,317)** and further in view of **Vohra et al. (US PGPub 2003/0152386)**.

Consider **claim 10 and as applied to claim 9 above**, Combs et al. disclose the invention as described above; except for, wherein each of the setup boxes further comprises: an O/E converter for converting the signals provided from the optical fiber; a first and second frequency converter for down-converting the broadcast signals and the communication signals from an intermediate frequency to a base-band frequency; and an E/O converter for E/O converting and transmitting the communication signals through the optical fiber.

In related art, Lehman et al. disclose a digital communication network. On the subscriber side; there is a network interface equipment 104, subscriber interface equipment 400 and subscriber communication equipment 460 (combination of the three equipments 104, 400 and 460 form the setup box). Network interface equipment 104, receive the WDM signal and demultiplex the signal into separate channels; then convert the optical channels into electrical channels using a plurality of optical-electrical (read as, O/E converter) converters; also it has an electrical-optical (read as, E/O converter) converter for converting upstream signals from subscriber back to local central node. The subscriber interface equipment 400 (read as, hub) perform necessary conversion and/or demodulating before outputting the signal to a computer or a television set; it can also receive upstream signals from subscribers (figure 8; column 15 lines 35-54; column 15 lines 60-65; column 16 lines 9-19; and column 16 lines 36-55).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate the teaching Lehman et al. with Combs et al. Since communications

using optical fiber allow for higher bandwidth than conventional coax-cable; optical-electrical and electrical-optical conversion unit is necessary for the optical communication system.

Combs et al. as modified by Lehman et al. disclose the invention as described above; except for, a first and second frequency converter for down-converting the broadcast signals and the communication signals from an intermediate frequency to a base-band frequency.

In related art, Vohra et al. disclose a multi-format optical signal transport of DWDM cable TV networks. The multi-format optical signal receiving device, 1030a, comprises a plurality RF down-converter mechanism 1130, 1140, and 1150. Each RF down-converter mechanism converts the intermediate frequency of the voice, video, and internet to the base-band frequency (figure 11; page 5 paragraphs 0063 and 0064).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate the teaching Vohra et al. with Combs et al. as modified by Lehman et al. Up-converting the frequency before transmission allow for more efficient transmission through the optical medium.

Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a) Nakamura et al., US Patent 5,343,314

b) Czerwiec et al., US Patent 5,687,014

c) Darcie et al., US Patent 5,790,287 A

d) Koren et al., US Patent 5,861,965

e) Harstead et al., US Patent 5,912,749

f) Cohen, Leonard G., US Patent 5,911,019

g) Pangrac et al., US PGPub 2001/0030785

h) Lin, Chinlon, US Patent 6,385,366

i) Effenberger et al., US PGPub 2002/0145775

j) Kim et al., US PGPub 2003/0099012

k) Con-Carolis et al., US PGPub 2004/0042796

l) Needle, Jacob, US Patent 6,978,091

m) Kung et al., US PGPub 2006/0141952

20. Any response to this Office Action should be **faxed to** (571) 273-8300 **or mailed to**:

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Hand-delivered responses should be brought to

Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

21. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Thi Le whose telephone number is (571) 270-1104. The Examiner can normally be reached on Monday-Friday from 7:30am to 5:00pm.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Rafael Perez-Gutierrez can be reached on (571) 272-7915. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 703-305-3028.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

Thi Le
July 25, 2006

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